AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. §1.121, the following is a complete listing of the claims of the present application. The following listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

1.-66. (canceled)

67. (withdrawn) An isolated filamentous polymer comprising polypeptide subunits coalesced into ordered aggregates, wherein at least one of the polypeptide subunits comprises a SCHAG amino acid sequence,

wherein the SCHAG amino acid sequence includes at least one substitution of an amino acid residue having a reactive amino acid side chain, and

wherein the reactive side chain of the substituted amino acid is exposed to the environment of the polymer to permit subsequent attachment of a substituent thereto.

68.-80. (canceled)

81. (withdrawn) A purified fiber comprising an ordered aggregate of polypeptides that comprise an amino acid sequence that includes a SCHAG amino acid sequence, wherein the amino acid sequence has two amino acid residues having selectively reactive amino acid side chains that are exposed to the environment and serve as selectively reactive sites in ordered aggregates of the polypeptide.

82.-100. (canceled)

101. (withdrawn) A purified fiber comprised of an ordered aggregate of polypeptides that comprise a SCHAG amino acid sequence, wherein the SCHAG amino acid sequence includes at least one substitution of an amino acid residue having a reactive amino acid side chain, and wherein the substituted amino acid is exposed to the environment in an ordered aggregate comprised of said polypeptides, wherein the SCHAG amino acid sequence comprises an amino acid sequence that is at least 70% identical to a member selected from the group consisting of SEQ ID NOs: 2, 4, and 50, and prion aggregation domain fragments thereof.

102. (canceled)

103. (withdrawn) A purified fiber according to claim 101, wherein the SCHAG amino acid sequence comprises the SUP35 amino acids 2 through 113 of SEQ ID NO: 2, or prion aggregation domain fragments thereof.

104. (withdrawn) A purified fiber according to claim 103, wherein the amino acid with the reactive amino acid side chain is selected from the group consisting of cysteine, lysine, tyrosine, serine, glutamate, aspartate, asparagine, glutamine, and arginine.

105. (withdrawn) A purified fiber according to claim 103, wherein the amino acid with the reactive amino acid side chain is selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine.

106. (withdrawn) A purified fiber according to claim 103, wherein the amino acid with the reactive amino acid side chain is cysteine.

107. (withdrawn) A purified fiber according to claim 106, wherein the polypeptides further include an epitope tag.

108. (withdrawn) A fiber according to claim 106, wherein the polypeptides further include a polyhistidine tag.

109. (withdrawn) A fiber according to claim 106, wherein the polypeptides further include a substituent attached to the reactive amino acid side chain, the substituent selected from the group consisting of an enzyme, a metal atom, an affinity binding molecule having a specific affinity binding partner, a carbohydrate, a fluorescent dye, a chromatic dye, an antibody, a growth factor, a hormone, a cell adhesion molecule, a toxin, a detoxicant, a catalyst, a light-harvesting substituent, and a light altering substituent.

110. (withdrawn) A fiber according to claim 106, wherein the substituent is a metal atom.

111.-116. (canceled)

117. (withdrawn) A fiber according to claim 101, wherein the SCHAG amino acid sequence comprises SEQ ID NO: 2, or prion aggregation domain fragments thereof, with the proviso that amino acid 184 of SEQ ID NO: 2 has been substituted for by cysteine.

118. (withdrawn) A fiber according to claim 101, wherein the SCHAG amino acid sequence comprises SEQ ID NO: 2, or prion aggregation domain fragments thereof, with the proviso that amino acid 2 of SEQ ID NO: 2 has been substituted for by an amino acid selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine.

119-122. (canceled)

123. (currently amended) A polypeptide according to claim ~~122~~ 144, wherein amino acid 184 of SEQ ID NO: 2 is substituted for by a cysteine.

124. (currently amended) A purified polypeptide comprising a SCHAG amino acid sequence that is at least 90% identical to amino acids 2 to 113 of SEQ ID NO: 2;

wherein the polypeptide self-coalesces into higher ordered aggregates,

wherein the SCHAG amino acid sequence comprises an amino acid with a reactable side chain selected from the group consisting of cysteine, lysine, glutamate, aspartate, and arginine substituted for the amino acid present at ~~the position in the SCHAG amino acid sequence that corresponds to~~ position 2 of SEQ ID NO: 2, and

wherein the reactable side chain is exposed to the environment in the polypeptide aggregates.

125. (currently amended) A polypeptide according to claim 124, wherein the SCHAG amino acid sequence has exactly one ~~of said~~ amino acid with a ~~the~~ reactive side chain.

126. (previously presented) A purified polypeptide according to claim 124, wherein the amino acid with a reactable side chain is a cysteine or a glutamate residue.

127. (currently amended) A purified polypeptide comprising a SCHAG amino acid sequence that is at least 90% identical to amino acids 2 to 253 of SEQ ID NO: 2;

wherein the polypeptide self-coalesces into higher ordered aggregates,

wherein the SCHAG amino acid sequence comprises an amino acid with a reactable side chain selected from the group consisting of cysteine and arginine substituted for the amino acid present at ~~the position in the SCHAG amino acid sequence that corresponds to~~ position 184 of SEQ ID NO: 2; and

wherein the reactable side chain is exposed to the environment in the polypeptide aggregates.

128. (currently amended) A polypeptide according to claim 127, wherein the SCHAG amino acid sequence has exactly one ~~of said~~ amino acid with a ~~the~~ reactive side chain.

129. (previously presented) A purified polypeptide according to claim 127, wherein the amino acid with the reactable side chain is a cysteine residue.

130-131. (canceled)

132. (previously presented) A polypeptide according to claim 124 comprising an amino acid sequence identical to amino acids 2 to 113 of SEQ ID NO: 2, except at the position in said amino acid sequence that corresponds to position 2 of SEQ ID NO: 2.

133. (previously presented) A polypeptide according to claim 127 comprising an amino acid sequence identical to amino acids 2 to 253 of SEQ ID NO: 2, except at the position in said amino acid sequence that corresponds to position 184 of SEQ ID NO: 2.

134. (previously presented) A polymer comprising polypeptide subunits coalesced into ordered aggregates, wherein at least one of the polypeptide subunits comprises a polypeptide according to claim 124 or 127.

135. (previously presented) A polymer comprising polypeptide subunits coalesced into ordered aggregates, wherein all of the polypeptide subunits comprise a polypeptide according to claim 124 or 127.

136. (canceled)

137. (previously presented) A polymer according to claim 134 that has a fiber morphology.

138. (previously presented) A polymer according to claim 137 attached to a solid support.

139. (previously presented) A polymer comprising polypeptide subunits coalesced into fibrous aggregates, wherein at least one of the polypeptide subunits comprises a polypeptide according to any one of claims 144-145.

140. (previously presented) A polymer according to claim 139, wherein the polymer is attached to a solid support.

141-143. (canceled)

144. (currently amended) A polypeptide comprising the SCHAG amino acid sequence of SEQ ID NO: 2, with the proviso that amino acid 184 of SEQ ID NO: 2 has been substituted for by a cysteine or glutamate, or comprising a sequence at least 90% identical to the SCHAG amino acid sequence of SEQ ID NO: 2 with the proviso that amino acid 184 of the sequence at least 90% identical to the SCHAG amino acid sequence of SEQ ID NO: 2 is a cysteine or glutamate, wherein the sequence~~fragment thereof that includes at least 50 amino acids of the N domain of SEQ ID: 2 and said substituted amino acid and that~~ self-coalesces to form higher ordered aggregates.

145. (currently amended) A polypeptide comprising the SCHAG amino acid sequence of SEQ ID NO: 2, with the proviso that amino acid 2 of SEQ ID NO: 2 has been substituted for by an amino acid selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine, or comprising a sequence at least 90% identical to the SCHAG amino acid sequence of SEQ ID NO: 2 with the proviso that amino acid 2 of the sequence at least 90% identical to the SCHAG amino acid sequence of SEQ ID NO: 2 is selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine, wherein the sequence ~~fragment thereof that includes said substituted amino acid and that~~ self-coalesces to form higher ordered aggregates.

146. (withdrawn) A purified fiber according to claim 101, wherein the SCHAG amino acid sequence comprises an amino acid sequence at least 95% identical to a member selected from the group consisting of SEQ ID NOs: 2, 4, and 50 and prion aggregation domain fragments thereof.

147. (withdrawn) A purified fiber according to claim 101, wherein the SCHAG amino acid sequence comprises an amino acid sequence at least 90% identical to a member selected from the group consisting of SEQ ID NOs: 2, 4, and 50 and prion aggregation domain fragments thereof.

148. (withdrawn) A purified fiber comprised of an ordered aggregate of polypeptides that comprise a SCHAG amino acid sequence,

wherein the SCHAG amino acid sequence includes at least one amino acid residue having a reactive amino acid side chain that is exposed to the environment in an ordered aggregate comprised of said polypeptides, and

wherein the polypeptides further include a substituent attached to the reactive amino acid side chain, the substituent selected from the group consisting of an enzyme, a metal atom, an affinity binding molecule having a specific affinity binding partner, a carbohydrate, an antibody, a growth factor, a hormone, a cell adhesion molecule, a toxin, a detoxicant, and a catalyst.

149. (withdrawn) A purified fiber according to claim 148, wherein the SCHAG amino acid sequence comprises an amino acid sequence at least 70% identical to a member selected from the group consisting of SEQ ID NOs: 2, 4, and 50 and prion aggregation domain fragments thereof.

150. (currently amended) A SCHAG polypeptide that comprises:

an amino acid sequence selected from the group consisting of:

(a) amino acids 2-253 of SEQ ID NO: 2;

(b) amino acids 2-113 of SEQ ID NO: 2;

(c) ~~fragments of (a) that self-coalesce into ordered aggregates and include at least 50 amino acids of the N-domain of SEQ ID NO: 2;~~

~~(c') fragments of (b) that are at least 50 amino acids long and self coalesce into ordered aggregates;~~

~~(d)~~ amino acid sequences that are at least 90% ~~70%~~ identical to (a)[[,]] or (b)~~, (c), or (c')~~ and that self-coalesce into ordered aggregates;

~~(e) sequence variants of (a), (b), (c), or (c') wherein sequence variations from (a)-(c') consist of addition, deletion, or substitution of 1-20 amino acids with the proviso that said variants of the fragments of (c) and (c') retain at least an equal enrichment for amino acids that promote self-coalescence (G+N+Q+S+Y) as does the original sequence of (c) or (c'), and that self-coalesce into ordered aggregates; and~~

~~(f) sequence variants of (a), (b), (c), or (c'), wherein sequence variations from (a)-(c') consist of insertions or one or more sequences selected from the group consisting of: PQGGYQQYN (SEQ ID NO: 10) and variants of SEQ ID NO: 10 wherein one or two residues have been added, deleted, or substituted~~; and

at least one substituent attached to a side chain of the SCHAG polypeptide, wherein the at least one substituent is selected from the group consisting of an enzyme, a metal atom, an affinity binding molecule having a specific affinity binding partner, a carbohydrate, a fluorescent dye, a chromatic dye, an antibody, a growth factor, a hormone, a cell adhesion molecule, a toxin, a detoxicant, a catalyst, a light-harvesting substituent, and a light altering substituent, and wherein the side chain is one that is exposed to the environment when the SCHAG polypeptide self-coalesces to form an ordered aggregate.

151. (previously presented) A polypeptide according to claim 150, wherein the substituent is selected from the group consisting of an enzyme, a metal atom, an affinity binding molecule having a specific affinity binding partner, an antibody, a cell adhesion molecule, a toxin, a detoxicant, and a catalyst.

152. (previously presented) A polypeptide according to claim 151, wherein the substituent is attached to the side chain of an amino acid of the polypeptide, wherein the amino acid is selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine.

153. (previously presented) A polypeptide according to claim 152, wherein the amino acid is cysteine.

154. (previously presented) A polypeptide according to claim 153, wherein the cysteine is substituted for position 2 or 184 of SEQ ID NO: 2.

155. (previously presented) A polypeptide according to claim 150 that is attached to a solid support.

156. (withdrawn; currently amended) A fiber comprised of:

SCHAG polypeptides as set forth in claim 150 coalesced into a fibrous ordered aggregate~~,~~

~~wherein the SCHAG polypeptides comprise an amino acid sequence selected from the group consisting of:~~

~~(a) amino acids 2-253 of SEQ ID NO: 2;~~

~~(b) amino acids 2-113 of SEQ ID NO: 2;~~

~~(c) fragments of (a) or (b) that self coalesce into ordered aggregates;~~

~~(d) amino acid sequences that are at least 70% identical to (a), (b), or (c) and that self coalesce into ordered aggregates;~~

~~(e) sequence variants of (a), (b), (c), or (d), wherein sequence variations from (a)-(d) consist of addition, deletion, or substation of 1-20 amino acids; and~~

~~(f) sequence variants of (a), (b), (c), or (d), wherein sequence variations from (a)-(d) consist of insertions or one or more sequences selected from the group consisting of: PQGGYQQYN (SEQ ID NO: 10) and variants of SEQ ID NO: 10 wherein one or two residues have been added, deleted, or substituted; and~~

~~at least one substituent attached to at least one polypeptide of the fiber wherein the at least one substituent is selected from the group consisting of an enzyme, a metal atom, an affinity binding molecule having a specific affinity binding partner, a carbohydrate, a fluorescent dye, a chromatic dye, an antibody, a growth factor, a hormone, a cell adhesion molecule, a toxin, a detoxicant, a catalyst, a light-harvesting substituent, and a light-altering substituent~~.

157. (currently amended) A polypeptide ~~fiber~~ according to claim 155, wherein the at least one substituent is selected from the group consisting of an enzyme, a metal atom, an affinity binding molecule having a specific affinity binding partner, an antibody, a cell adhesion molecule, a toxin, a detoxicant, and a catalyst.

158. (currently amended) A polypeptide ~~fiber~~ according to claim 157, comprising at least two different substituents.

159. (currently amended) A polypeptide ~~fiber~~ according to claim 157, wherein the at least one substituent is attached to the side chain of an amino acid of the SCHAG polypeptides, wherein the amino acid is selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine.

160. (currently amended) A polypeptide ~~fiber~~ according to claim 159, wherein the amino acid is cysteine.

161. (currently amended) A polypeptide ~~fiber~~ according to claim 160, wherein the cysteine is substituted for position 2 or 184 of SEQ ID NO: 2.

162. (currently amended) A polypeptide ~~fiber~~ according to claim 156 that is attached to a solid support.

163. (new) The SCHAG polypeptide of claim 150, wherein the SCHAG polypeptide comprises an amino acid sequence at least 90% identical to (a) or (b), wherein said amino acid sequence comprises an amino acid with a reactive side chain that has been substituted for an amino acid that is exposed to the environment in the amino acid sequence of (a) or (b).